IN YOUR BEST FORM

A Series of Broadcast Talks
for Diabetics and their Families

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IN YOUR BEST FORM

A series of talks for diabetics and their families

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1. Are Diabetics Ill People ?

DOCTOR: I have brought along four diabetics from a hospital diabetic clinic, and I'm going to ask them a few questions, so that they can tell you how they get along with their diabetes. I should let you know they are all fairly severe diabetics, who take insulin every day.

Now Mrs. Gotts. You are one of our oldest customers at the clinic—you certainly go back long before my time, don't you ? So would you just remind me how old you are ?

Mrs. GOTTS: I'm 74 and I've been taking insulin for 22 years; it's 23 years since I first went into hospital.

DOCTOR: How much did you weigh then ?

Mrs. GOTTS: I weighed 7 stone and a pound or two at the time, and now I weigh 11 stone 12 pounds.

DOCTOR: How many children have you ?

Mrs. GOTTS: Three children, all perfectly well and all married.

DOCTOR: Have you been able to do your own housework ?

Mrs. GOTTS: Always—and I still do.

DOCTOR: You haven't lost much time through your diabetes ?

Mrs. GOTTS: I had two weeks in hospital at the beginning and a few days this year. Apart from that I've only seen a doctor once in the 22 years. I called him in for influenza.

DOCTOR: And Mrs. Lewis, you are how old ?

Mrs. LEWIS: 70.

DOCTOR: How long have you had diabetes ?

Mrs. LEWIS: I got it when I was in Australia in 1923. I went down to 6 stone then. You should have seen my photograph when I first went out and when I came back—the passport people wouldn't believe it was the same person.

DOCTOR: And now you weigh ?

Mrs. LEWIS: 9 stone 8—just nice and steady.

DOCTOR: Did you start insulin in 1923 ?

Mrs. LEWIS: Yes, I must have been one of the first patients to have insulin. I must have had 20,000 injections and I'm still going strong.

DOCTOR: You've brought up quite a big family haven't you ?

Mrs. LEWIS: I've brought up 5 children and always done all my own work. And I've got 8 grandchildren and 2 great grandchildren now.

DOCTOR: Any of them got diabetes ?

Mrs. LEWIS: No, none of them.

DOCTOR: Have you had any other complaints ?

Mrs. LEWIS: Since the first time, I've been to hospital again for a month or two but I've never called in a doctor in all those years.

DOCTOR: That makes diabetes sound almost like a recipe for good health. By the way, both Mrs. Gotts and Mrs. Lewis are living alone nowadays, doing all their own work; giving themselves their own insulin and managing very nicely. Let me see how old are you Pamela ?

PAMELA: 17.

DOCTOR: And you haven't been a diabetic long ?

PAMELA: Only a year next month.

DOCTOR: And what do you do ?

PAMELA: I'm a shop assistant—in a grocer's shop.

DOCTOR: I know you were in hospital to begin with, and they taught you how to give your own insulin ?

PAMELA: I was scared of doing it myself but then I saw the sister coming up the ward and it was in, in no time ! At home my two sisters watch me and see I keep to it—they keep me straight.

DOCTOR: How do you spend your spare time ?

PAMELA: I go cycling on Sundays,

right out into the country—I did 40 miles last Sunday.

DOCTOR: What about food?

PAMELA: Oh, I take sandwiches, the diet sheet tells you how.

DOCTOR: And Jimmy? Jimmy's been on insulin since he was 6 by the way. He's now 17 and is another long distance cyclist. How do you feel about having diabetes, Jimmie?

JIMMIE: You don't think anything of it—there's nothing wrong with you, you just take your insulin every day. I detest people pitying me—neighbours who don't understand.

PAMELA: When you go out to tea and say "No sugar, thank you," they say "Oh, we've got plenty." I say "I never take it." They want to know why; they keep on asking and then they say "Oh poor girl—fancy, at your age!" They depress me when they say that kind of thing.

JIMMIE: I give them a bit of my mind, but what I say is not fit for broadcasting. People mustn't go about feeling sorry for us—we're just as well as anybody else.

DOCTOR: Perhaps you are yourself a diabetic, or perhaps you have a diabetic in your family, or amongst your relations. In any case, I hope you took in what you have just heard, and especially the last few remarks. We asked these four people to come along for one main reason and that is to show you that properly treated diabetics should feel quite well and do almost all the things that the rest of us do. I say almost all, because it would be wrong to encourage them to pretend they have no handicap at all, and thus perhaps to do things which might lead them or other people into real and unnecessary danger. But with proper treatment it is only a very few things that they shouldn't do.

Diabetes is an illness in which the body is unable to use sugar. Now sugar is formed in the body from what we call the carbohydrate in the food. This includes not only the sugar we eat, but also the bread, flour, potatoes and foods like that. Diabetics cannot use this sugar, so it accumulates in the blood. Untreated patients get rid of it by passing enormous quantities of urine; this fluid loss makes them terribly thirsty, so that they drink enormous quantities of water to replace it. At the same time they feel ill and tired, and grow thin.

Mild cases can often be successfully treated by a diet, which reduces the carbohydrate of the food to an amount which the patient can use, and incidentally this diet often reduces his weight. These mild cases usually occur in older people and often in fat people, so the loss of weight may be a good thing. But in severe cases, which have not been treated, the patient is usually already thin and weak; a restricted diet would simply make him thinner still and would, at best, only prolong his life for a time. Severe diabetes was, in fact, a death sentence until the year 1922. In that year two Canadians, called Banting and Best, first prepared insulin, one of the three or four most dramatic medical discoveries of this century. Insulin is made by a gland called the pancreas and controls the use of sugar by the body. It has no effect when taken by mouth, but injections of insulin will enable diabetic people to make use of sugar in the ordinary way, and so to regain their health and energy. Diabetes, you see, is one of the disorders due to the absence of something right—insulin—rather than to the presence of something wrong. It follows that insulin does not cure diabetes, and unfortunately those who need it usually have to go on taking it for life.

That is a very brief and simplified explanation but it will do for the present and we shall fill in some of the gaps later.

The exact number of diabetics in this country is not known but it is said to be between 150,000 and 200,000. Let's say 150,000. The number is rising, mainly because with modern treatment diabetics live much longer. Intelligent ones who are well treated can indeed expect to live as long as other people, and they can now insure their lives. It goes without saying that it is important to these 150,000 people that they should be properly treated. It is perhaps equally important to their families and relations that they should be fit and able to earn their livings. And lastly,

a country that is short of man and woman power, must be interested to see that these 150,000 should be well and able to do their share of work. So we come back to the question of what is proper treatment for diabetes? Proper treatment begins with strictly medical things—that is with the prescription by the doctor of the correct diet, or diet and insulin injections for the case. But treatment only begins there. It ends, you might say, when the patient is usefully employed and is living as normal and happy a life as is possible for him or her. This part of the treatment doesn't only concern the doctor, but also a lot of other people. It concerns the patient who has to adapt himself to a new life, and has an awful lot to learn. It concerns everyone, the doctor, the people in the diabetic clinic, the dietitian and so on, who have to teach him, and go on teaching him, how to manage things. It involves his family whose attitude can help to make him an invalid or a defiant rebel on the one hand, or a healthy person on the other. Family and friends can do a great deal to help, but sometimes with the best intentions they do harm. And finally it involves employers and, sometimes, the public at large.

I wish everybody, who has or is going to have anything to do with diabetics, could have heard those four patients. Notice that they were all doing a regular full day's work in their different ways. Notice that they had no more time off for sickness than plenty of other people do, and a good deal less than some. Notice that the two youngsters had learnt how to arrange things so that they could do what they wanted in their spare time; and that in each case this was fairly strenuous exercise. And notice, lastly, that pity doesn't help. I can tell you, even if the patients didn't, that diabetics do have difficulties and they do appreciate real help, help from the kind of people who understand and don't talk. So if you have a diabetic friend or relative, or you employ a diabetic, try and understand their difficulties and quietly and unobtrusively give them a bit of help, when they need it. But don't talk about it and treat them the rest of the time just like other people. You see, diabetics want to feel normal. Anything that helps them to live normal lives makes them feel better. Pity, and I might add fussing, make them feel less normal, and that makes them angry and sometimes a little defiant. So real help please, and sympathy, if you like, but no pity and no fuss.

2. Life on a Diet

In mild cases, the patient can be given a diet, in which carbohydrate is reduced to an amount that he can make use of. In more severe cases, he must be given a diet containing a fixed daily amount of carbohydrate, and a dose of insulin which will enable him to use this carbohydrate. The result in either case should be the same—the patient is able to make use of the carbohydrate that he eats; sugar does not accumulate in the blood, and so does not come out in the urine. I want first to deal with two very common misconceptions. The first is that diabetics must be underfed—half starved in fact. That's quite untrue. It's especially untrue of diabetics on insulin. They should be getting enough food to give them energy to do their work and feel well. They should never feel unduly hungry and certainly not anything like half starved. The only diabetics who should be on short rations are the fat ones who are really overweight. Diabetes tends to occur in fat people, and fat diabetics don't keep as well as thin ones. In fact, they sometimes do very badly. Doctors all agree, I think, that fat diabetics should if possible have their own weight reduced to about a normal figure for their height and age—should be streamlined in fact. This can only be done by giving them a diet of low food value. It sounds hard but there is no way out of it. There is no safe way of reducing weight other than dieting, and in spite of many patients' statements to the contrary, weight can always be reduced by a strict enough diet. It may have to be very strict, and this may require severe self discipline at first. But there's one crumb of comfort—once the patient has got his weight down to normal he usually feels much better, much more energetic, and can then often eat a more

normal diet (as long as he is careful) without putting weight on again.

The second misconception is about the kinds of food that diabetics can eat. There's a general idea that they can't eat this, that or the other foods because it's bad for them. There is really no kind of food that diabetics can't eat. It is all a question of amounts and of knowing the value of the foods in terms of carbohydrates, protein and fat.

What really matters is that the diabetic should eat the same, or very nearly the same amount of food each day, and at about the same time each day, in order to balance his dose of insulin. There shouldn't be anything very difficult about that. It's what most of us do, except, perhaps, for an occasional burst of some kind. It is the carbohydrate that matters most, the protein and fat rather less so. Protein, by the way, is body-building food, and meat and fish are the best examples, though eggs, milk and cheese all contain it. I don't think I need explain what fat is. It doesn't matter in what form you take your allowance of carbohydrate for a particular meal, provided you take the right amount. Why then don't diabetics eat chocolate, sweets, sugar, sweet puddings and so on? The real reason is that these are very concentrated forms of carbohydrate. If they took their carbohydrate in that form they would only get a very small and unsatisfying amount. For instance a 4-oz. bar of chocolate would probably contain a quarter of the allowance of carbohydrate for the whole day, and you would get awfully hungry if you couldn't eat enough bread or potatoes to fill you, because you had had some chocolate. Further if the patient did start taking his carbohydrate in this form—chocolate and so on—he would almost certainly be tempted to take much more than he was allowed, and then trouble would begin.

If we leave out the very concentrated foods, there's really no limit to the variety of food which a diabetic can eat—provided he eats the right amount. It is all a matter of knowing how to vary the diet, and this is part of the education of the diabetic, which as I said is one of the most important parts of his treatment.

I have brought along a Sister dietitian from a diabetic clinic so that you can see how a diabetic learns to vary his diet. The dietitian turns the figures which the doctor gives her into a diet and explains to the patient how he can vary it to suit his own tastes; how, for instance, he can take caviare or conger eel in place of meat, if he wants to; and how to meet the needs of the way he lives—how for instance to take his dinner to work in the form of sandwiches.

She is going to talk first to Cedric's mother. Cedric is 12, and the main difficulty with him has been to get him to eat up all his diet. Why should he? First, so that he will grow normally, and secondly so that he will get enough food to balance his dose of insulin. People often think being on a diet means only that you mustn't eat more than it says on the diet sheet, and that it doesn't matter if you eat less. This is not so. If a diabetic taking insulin misses a meal or eats much less than his diet sheet states, the level of sugar in his blood may fall till he gets what we call an insulin reaction. I shall talk about these again. In the meantime, notice it is just as important that a diabetic should eat his diet, as it is that he should not eat more than his diet.

Mrs. SCOTT: Well, of course, you know all about Cedric's extra diabetic rations—extra rations of meat, cheese and fats. You have to give us his sugar ration, but he should still be getting his sweets. Is he getting his school milk?

Mrs. PARFITT: Oh yes—he gets that.

Mrs. SCOTT: Do you use the list of alternatives to the things on the diet sheet—every diabetic must have that?

Mrs. PARFITT: At first I was always running through papers and saying to myself now where did I just put it—but now I have his diet sheet and the list of alternative foods up on the inside of the kitchen cabinet.

Mrs. SCOTT: You know how to use dried egg, scrambled with a little fat instead of bacon? and instead of a milk pudding he can have orange and milk either as junket or as milk to

drink ? Of course you must look up the amounts on the list. Are you using the foods with so little carbohydrate that you needn't count them at all ? Rhubarb, and gooseberries stewed with saccharine instead of sugar ? Cabbage, cauliflower, lettuce, radishes, tomato, cucumber or watercress, as often as he likes.

Mrs. PARFITT: Yes I give him those, when I can get them. Of course they are rather expensive.

Mrs. SCOTT: Do you weigh his food ?

Mrs. PARFITT: I do make a point of weighing—I weigh everything. Of course if you have a little mishap with your scales you do learn to judge but weighing is more satisfactory.

Mrs. SCOTT: Do you take meals out ?

Mrs. PARFITT: Well, I try to avoid it.

Mrs. SCOTT: I think you ought to try it—a picnic or an outing somewhere that means a meal in a café. We don't want to let Cedric grow up thinking he can't go out because of his diet. You can either take his food along, or just guess it.

DOCTOR: I think that's a most important point. It's possible to be too strict about dieting as well as not strict enough. If a diabetic was always to weigh everything he ate he'd hardly be able to go out at all, it would be difficult for him to travel, and he wouldn't be able to take a job unless he could get home to meals. That would make him practically an invalid. A few doctors go to the other extreme and say " take enough insulin and eat what you like." I think myself that that is risky and the reasonable thing is to take a middle course, to strike a balance, you might say, between being over-careful and being reckless. What does the dietitian say about that ?

Mrs. SCOTT: I recommend patients to weigh their food regularly at first until they know what the portions they are allowed look like. Once the patient has got used to his diet and knows what the various portions look like, I tell him to give up weighing as a routine, and to guess. This works perfectly with some patients, but a lot depends on the patient, and it's only human to be a bit generous when we're guessing a portion of something we're fond of. So I tell most patients to check their guessing now and then—say once a week—by weighing all their food for one day. I'd like to hear David now.

DAVID: Well, I work in a factory where there's a canteen. There's two things I do. Sometimes I take my whole dinner as sandwiches to work. That's easy because it's on the diet sheet. Other times I get my dinner in the canteen, but I take two or three ounces of cold meat with me and put it in with the canteen meals.

Mrs. SCOTT: How do you manage to keep to the right amounts in the canteen ?

DAVID: I guess.

Mrs. SCOTT: You've been on a big diet because you hadn't stopped growing —in fact you've got the biggest diet in the whole clinic—4,000 calories. Do you manage to get all that on your ration ?

DAVID: Well, I wouldn't be able to if I didn't have my dinner most days in the canteen, and I think I eat more than my share of bread—but my mother hardly eats any bread, so it works out all right.

Mrs. SCOTT: And how often do you weigh your food to see if you're guessing right ? Once a week ?

DAVID: Well—yes, sometimes.

DOCTOR: I think that shows you that this diet question needn't keep anyone at home, if he will take some trouble to learn the tricks of dieting. David Brace is, in fact, a severe diabetic, who takes about 140 units of insulin a day. He goes to work; he goes to evening classes; he sat for a chemistry examination last night; and I don't think he misses a party often if there's one going. But he has kept very well, and in the last two years has filled out into a big, well-built young man.

There's one more thing I'd like you to notice. Diabetic diets are not invalid diets. Except when they're ill, diabetics don't need special food. They can usually eat what the rest of the family does, and, except perhaps for some growing lads on an extra big diet, they shouldn't be eating any of the rest of the family's rations.

We've tried to show you that living on a diet isn't as bad as it sounds, that the business of dieting needn't keep a diabetic at home, and that having a diabetic in the family shouldn't upset the family catering very much.

All that depends of course on how much the diabetic or his mother or his wife knows about the diet, and how to vary it. This means hard work, but it's worth it. It means that the diabetic can be a free man as far as dieting goes, and he can have that freedom without unnecessary risk.

3. Insulin

First some obvious practical points. If a diabetic patient is taking insulin, it is essential that he should get the right kind of insulin, and the right strength of insulin, that he should give himself the right dose, in the right way, and at the right times. It sounds formidable, doesn't it ? But you soon get used to it and it becomes almost second nature.

The right kind of insulin. There are three kinds in use. The first is *soluble or clear insulin*—clear because it looks like water in the tube. It acts quickly and last 4 or 5 hours, so patients have to take two or even three injections a day.

The second is *zinc protamine or cloudy insulin*. This looks slightly milky in the bottle. It acts slowly but lasts for 24 hours or even more. Many patients, therefore, can now take one dose of zinc protamine insulin a day, or a single dose partly of zinc protamine and partly of soluble insulin.

The third kind is *globin insulin*, which also acts slowly and lasts for about 24 hours. Unfortunately it is a clear solution and looks like soluble insulin in the bottle.

The next question is the strength. Soluble insulin is made in three strengths and zinc protamine and globin are each made in two strengths. There are, therefore, seven different kinds of insulin that you can buy, and you must get the right one. It has now been arranged that each kind shall be packed in a different coloured package. All you need do is to see that you always get a box with the same colours on it. So unless both you and the chemist are colour blind, there shouldn't be any mistake.

Measuring insulin gives some people a lot of trouble. I haven't time to explain this, but if you are in any doubt about measuring your dose, you should take your insulin and your syringe along to the doctor or diabetic clinic, and get them to explain it to you on your own syringe.

I am not going to describe how to give injections. You must learn that from a doctor or nurse. If you haven't already done so do learn to give your own insulin so that you are independent; unless of course your sight isn't good enough or you have some real handicap.

What happens if a patient takes too much insulin ? Well, he's likely to have an insulin reaction. This may also happen if, having taken his right dose, he misses a meal or is late with a meal, or if he undertakes some unusual exertion. In each case the reaction is due to the same thing—to the fact that the level of the sugar in the blood has fallen too low.

The forms taken by reactions differ with the different kinds of insulin and in different people. In fact reactions are very individual affairs. Reactions to soluble insulin occur within a few hours of the dose, and the patient usually knows they are coming on. Reactions to the delayed action insulins —zinc protamine, and globin—may occur any time during the day and sometimes during the night. They may come on rather suddenly and the forms they take are very variable. I am not going to describe these reactions because the patients we are going to talk to can do that much better than I can.

Since reactions are due to too low a level of sugar in the blood they can be corrected by giving the patient sugar in any form—lumps of sugar, boiled sweets or glucose tablets—or by hurrying up the next meal. The sugar acts quickest if it is dissolved in a little water. Two or three lumps will usually do the trick. Patients know all about this. They should always carry sugar with them and take it as soon as they need it.

If a patient is nearly unconscious, but not quite, you can get him to swallow sugar dissolved in water if you put it in his mouth with a spoon. If he should become quite unconscious you must of course get a doctor as quickly as possible, or get the patient to a hospital.

Here are two diabetics to tell us how they manage on insulin. Mrs. Vincent has taken it for eighteen years and Mr. Piggott for five. They're both active people and I think between them they know nearly all there is to know about how to use insulin. One question that I am sure comes to all of us is how much do injections of insulin hurt ? What do you say Mrs. Vincent ?

Mrs. VINCENT: Well, I find they hurt very little—you hardly notice them.

Mr. PIGGOTT: I had quite a lot of injections in the army. I think they always found the bluntest needle there that they could, and those injections were always painful. Now I give my own; I always use a sharp needle and I hardly feel them. You don't hurt yourself.

DOCTOR: I wonder whether you can remember what it was like to start taking insulin ?

Mrs. VINCENT: Before I started insulin I was terribly tired, I had no energy and my weight had gone down to 5 stone. I used to drink pints and pints of water. After a week on insulin the thirst had practically gone and I'd put on 10 lbs. I felt *so* much fitter. I think now, I've more energy than I had before I ever got diabetes.

Mr. PIGGOTT: I was in the army in Yorkshire when I got it. I was almost on my knees for lack of energy, and for the last ten days or so I was drinking literally gallons of water. I'd lost over two stone in weight. On insulin I got my energy back in about six weeks, and felt entirely different.

DOCTOR: We all realise I think that living on insulin is no joke. You two remember what you were like before you had it—you know all about taking it—and you know how you feel now. Is it worth it ?

Mr. PIGGOTT: } Very definitely.
Mrs. VINCENT: } Every time.

DOCTOR: Well there doesn't seem to be much doubt about that. I think we'd like to hear something about insulin reactions.

Mrs. VINCENT: I used to have them at night, but I haven't had them for some time now. In the day-time I get them after taking more exercise than usual such as walking or cycling. I remember once soon after I left hospital I was walking along and I felt my ankles going funny and then my knees, and I just toppled over. My husband—of course he knows all about it and just what to do—took me into a shop and got me some sugar and I was soon all right again. Of course I always carry sugar, but sometimes it gets so old and dirty.

DOCTOR: You don't often have them now. How do you avoid them ?

Mrs. VINCENT: Well, when I'm going cycling or walking or dancing—I do a lot of dancing—I usually have a bit extra to eat and then I'm quite alright. And I see I have my meals at the right times. Sometimes if your lunch is a bit late you feel very peculiar You feel slightly drunk. You know you've got to eat but you can't seem to manage the knife and fork, and your eyes go funny.

Mr. PIGGOTT: I've had that too—in fact I sometimes see double.

DOCTOR: What happens to you ?

Mr. PIGGOTT: The first thing I notice is what I call butterflies in the tummy, and a feeling of pins and needles in my tongue. Then I sweat like a pig and get weak at the knees. I start to speak and suddenly trail away to nothing or go back and say the same thing again, like a gramophone record that's stuck. But usually other people—people that know me—notice it first, because my actions appear rather indecisive.

DOCTOR: You take quite a lot of exercise. How do you manage that ?

Mr. PIGGOTT: It depends what I'm doing. I play hockey and tennis, I swim a lot and last year I went ski-ing in Switzerland. Hockey's easy, I just take one or two glucose tablets at half time.

DOCTOR: Why do you use glucose tablets ?

Mr. PIGGOTT: Well it saves the family's sugar. I buy the tablets from my chemist—you get quite a lot for a shilling.

DOCTOR: Tell me about your ski-ing.

Mr. PIGGOTT: It's the most energetic sport I've ever taken up. I found I had to decrease my morning dose of insulin and always carry plenty of glucose tablets. However I used to do a whole day's ski-ing, and except for the others there in the party who knew all about it, no one I met had any idea I was a diabetic.

DOCTOR: You take some zinc protamine insulin. Do you ever have reactions at night ?

Mr. PIGGOTT: If I do I always wake up first. I look at my alarm clock and because it's so early I realise there's something wrong. Then I take the glucose tablets which I always keep lying beside the clock.

DOCTOR: You're lucky in that you wake up first. But as a matter of fact many diabetics find the same thing—that they wake first, and are quite all right if they take some sugar or glucose as soon as they wake up. I'm rather interested to know whether you carry cards stating that you are diabetics and what dose of insulin you take.

Mrs. VINCENT: Yes I always carry mine, in fact I've got two—one was a disc meant for the air raids, but I still carry it.

Mr. PIGGOTT: I carry a card in my wallet.

DOCTOR: Do always carry it. However well controlled you are you may have a reaction one day and be glad of it. Diabetics have been found unconscious or apparently drunk or behaving peculiarly in some way or other and that card has saved them no end of trouble.

Mr. PIGGOTT: I know we sometimes behave oddly in a reaction and say things we don't mean. I think it would be helpful if people would remember that. When you have a reaction you may do or say things you don't mean at all—and afterwards you can't remember anything about it.

DOCTOR: You haven't told us about the tennis.

Mr. PIGGOTT: Well I play tennis in the summer at least two evenings a week and every Saturday and Sunday. On Saturdays and Sundays I reduce my dose of insulin—on my doctor's instructions of course—and when I'm playing I eat a lot of tea. Sometimes I have to take some glucose tablets as well.

DOCTOR: I notice you remained in the Army, for two or three years with diabetes.

Mr. PIGGOTT: Yes I worked in the War Office. As a matter of fact I was in an operational department with a large number of people working for me.

DOCTOR: And some employers won't give diabetics responsible jobs ! Did anything ever go wrong ?

Mr. PIGGOTT: No I had no trouble at all—in fact nothing ever went wrong.

DOCTOR: It's obvious, isn't it, that this business of insulin reactions is a very important matter for the diabetic. Reactions are much best prevented, as you have heard, but they are liable to occur occasionally even in the best regulated diabetics.

The doctor does his part by seeing that the patient has the right kind and dose of insulin, a properly arranged diet and so on.

The patient does his part by seeing that he takes his right dose of insulin, takes his meals regularly, carries his sugar with him and takes it at the first sign of a reaction—without waiting to see if it is going to be a bad one.

And finally all of us can help. If you know someone is a diabetic don't keep him waiting for his meals. If you ask him to dinner at one and keep him talking till two you may well land him in difficulties. If you have a diabetic friend or relative—learn a bit about his reactions and how to deal with them. You may save him a lot of trouble.

4. Growing Up with Diabetes

Diabetes can occur in small children, but fortunately it is very rare under six years of age, and rare in children of any age. However why do some children get diabetes ? We don't know, any more than we know why anybody gets it. We can say that it is no fault of their parents. When a child develops

diabetes parents often start wondering whether they are to blame, whether something in the past of one or other of them is responsible for this — this tragedy, as it seems. The answer quite definitely is no.

Is it a hereditary taint ? Well, there is no doubt that a tendency to diabetes runs in some families, but diabetes is quite definitely not a hereditary taint in the sense that it is necessarily passed from parents to children.

We'll talk about this another time, in the meantime stop worrying about why or who is to blame; accept that the child has diabetes—there are as a matter of fact many much worse things he might have—and realise that diabetic children can grow up happily and normally. Perhaps the most remarkable effect of insulin is that it has made it possible for these children not only to survive, but to grow normally and attain full physical and sexual maturity.

Bringing up a child with all the added difficulties of diabetes calls for knowledge, skill and constant care; and it must often be an anxious business. But we must keep that anxiety to ourselves. Over anxious parents are just as bad for the diabetic child as for any other child. The diabetic child must be made to feel secure, and as soon as possible taught all about his illness so that he can cope with the difficulties himself. It is surprising how good children get at managing their own diabetes. But he mustn't be fussed over; he mustn't feel that we are anxious; he mustn't feel that people pity him and he mustn't be made to feel in any way " different " from other children. The child must be brought up to take his handicap as lightly as possible—to see it as a bit of a nuisance, but something which he can learn to overcome.

I am going to ask someone with a unique experience of diabetic children what she thinks about some of these things.

Sister has what is probably the largest diabetic family in existence, 35 boys and 28 girls—ages six to sixteen.

I must tell you about this family. In 1939 the Diabetic Association and the London County Council realised that there should be some provision for evacuated diabetic children. And so the diabetic section of the London County Council residential school at Hutton in Essex came into being. All through the war fifty or more diabetic children lived and had their schooling there.

The experiment was so successful that the London County Council have kept it going in peace time, as a school to which diabetic children can be sent if for some reason they can't be looked after at home.

I wish some of you could have come with me to Hutton the other day to see this Diabetic School. You would have realised very quickly that diabetes in a child needn't be a tragedy at all.

The first scholar we met was Ruth age 6. She presented herself rather shyly. She had something important to tell the doctor. With immense pride she announced she had given her own insulin. She had always wanted to and that morning she had actually been allowed to do it—been allowed to, notice. " I stuck the needle in all by myself and nobody had to help me."

I think that little incident is worth noticing. Perhaps children with diabetes don't feel about it as we adults would expect them to. What do you say, Sister ? What do the children think about it themselves ?

SISTER: Diabetes to them is nothing now. Of course, it's a bit of a curse having to have an injection every day, but they've plenty to eat and plenty to drink, they're not restricted in any way, and as a general rule do all the things the other children at Hutton do. It's no longer a handicap when they understand all about it.

DOCTOR: Ah yes, your children learn to look after themselves, diabetes or no diabetes, and that makes all the difference. How do they compare with other children at work and so on ?

SISTER: They hold their own very well both at work and games. Of course they think they're as good as or better than any children in the school. In fact they get a little smug sometimes. But they do resent being shown off as diabetics — and being treated as " special " children.

DOCTOR: Do you have any particular difficulties with them ?

SISTER: Well of course children do have reactions easily. But they all carry glucose tablets and they all know what to do about them. I think the most difficult thing is the easy way they slip into ketosis.

DOCTOR: I ought to explain that ketosis is the first step towards diabetic coma. It happens if a diabetic stops taking his insulin or sometimes if he just has a cold or an infection of some sort.

SISTER: In children *the* cause is vomiting. If they vomit for any reason, they're very likely to get ketosis and they get it very quickly.

DOCTOR: How do you spot it ?

SISTER: They get drowsy and difficult. You can smell the sweet smell of acetone in their breath; and of course we test the urine of any child that is a bit off colour straight away.

DOCTOR: The children at Hutton quite plainly are growing up normally in spite of their diabetes. In fact they're showing that it can be done.

How can it be done ? What are the most important things in the management of diabetic children ? First, all diabetic children need injections of insulin. Don't let there be any mistake about this. It would be a crime to attempt to treat a child with real diabetes in any other way.

Secondly diabetic children must be given enough to eat. In proportion to their size they must be given much more than adults. This is so that they will grow and develop normally—and so that they will keep to their diets. A child that is always hungry obviously won't keep to its diet.

Thirdly diabetes in children needs much more careful management than it does in grown up people. The aim is to keep them free from insulin reactions on the one hand and free from any trace of ketosis on the other; and the difficulty is that they get both these much more easily than adults do.

We talked about insulin reactions in the last number. The problem is really just the same in children as in adults.

We'll talk about ketosis and diabetic coma at more length another time. In the meantime remember that ketosis is the first step towards diabetic coma. Ketosis should be suspected whenever a diabetic child vomits or is off colour for any reason. It is recognised for certain by testing the urine for what are known as ketone bodies. I think everyone who has the care of diabetic children should learn the simple tests for these substances, so that they can test the urine and recognise ketosis at the earliest possible moment.

The treatment of ketosis really is urgent, because it may go on to diabetic coma; and it is definitely a matter for the doctor and in bad cases for the hospital. If a diabetic child starts to vomit and you think or know he has ketosis, call in the doctor at once, so that he can arrange, if he thinks fit, for the child to go straight to hospital; or take the child straight to hospital yourself. In any case there must be no delay.

In the meantime don't on any account stop the insulin injections. Continue with the normal dose of insulin and if the child can't eat or can't keep down its normal food, give it the equivalent of its meals in the form of glucose drinks or drinks containing ordinary sugar. This is quite easy if you know the carbohydrate value of the meals and know that a lump of sugar or a level teaspoonful of either sugar or glucose is equivalent to 5 grams of carbohydrate. If you are in any doubt about this ask your doctor or ask at the diabetic clinic. And don't wait till the emergency arises—ask at your very next visit.

I hope I have convinced you that diabetes in children needn't be a tragedy at all. Diabetic children can grow and develop normally. This means knowledge, skill and devoted care on someone's part, perhaps for many years. But the reward—a happy, well-grown and self-reliant young diabetic—is a rich one.

5. Complications and How to Avoid them

The first kind—ketosis and its sequel diabetic coma—are immediate complications. I mean they may come on at any time in a diabetic's life and come on quickly. The other kind—things that happen to the eyes, the nerves and

the legs and feet, are late complications usually after diabetes has been present for some years. And I am going to talk mainly about the prevention of these complications because they are obviously best prevented and prevention is as much the patient's business as the doctor's.

First ketosis and diabetic coma. I said that patients with untreated diabetes are unable to make use of sugar, so that it accumulates in the blood and comes out in the urine. In more severe cases the body is also unable to make proper use of fats and so substances which result from the incomplete utilisation of fats also accumulate in the blood and come out in the urine. These are organic acids and are called ketone bodies; hence the name ketosis for the state in which they accumulate in the blood. Now ketone bodies are poisons and give rise to serious symptoms. With mild ketosis a patient may just feel off colour. When it's more severe he may have nausea, vomiting and abdominal pain. Very soon he gets a dry tongue and a dry skin, and there may be a sweet smell of acetone in his breath. A patient in this state needs urgent treatment. If he doesn't get it, his breathing becomes deeper, he gets drowsier and he goes into diabetic coma. A patient in severe diabetic coma is quite unconscious with a dry skin and a dry tongue, deep sighing respiration and a smell of acetone in the breath. When the urine is tested, it's found to contain large quantities of sugar and of the ketone bodies that we have been talking about.

Diabetic coma is a very serious matter. The patient must be admitted to hospital at once and requires vigorous and highly skilled treatment, with large doses of insulin, fluids given by vein or stomach tube and so on. If treatment is begun soon enough and is vigorous enough, most patients with diabetic coma can be saved; but unfortunately a small number of diabetics still die every year from this cause. I think it's fair to say that nearly all of these deaths are unnecessary—because with a little knowledge they could have been prevented.

How does ketosis arise? If a fit diabetic simply stops taking his insulin, he may develop ketosis and this may go on to coma. Never stop taking your insulin, unless your doctor decides after careful investigation that you no longer need it. If a diabetic gets a cold, a sore throat, influenza, a boil or in fact an infection of any kind his need for insulin usually increases and so he may develop ketosis, even if he goes on taking his normal dose. The same thing may happen, particularly in children, if they vomit for any reason.

I have mentioned two ways in which ketosis may arise, but *the* cause of serious ketosis and diabetic coma is in fact a combination of these two. The story is nearly always the same. A diabetic patient gets a sore throat or vomiting or something that makes him unable to eat his normal diet—and he therefore stops taking his insulin—at a time when he needs not less insulin but more. There is no surer way of getting ketosis and diabetic coma.

I think every diabetic should be given precise instructions about this. The point is that if you are ill—you must continue with your insulin, and take about your normal amount of carbohydrate. You cannot eat the bread—potatoes and so on—in your diet. Right, you must have your carbohydrate in fluid form. Say your diet contains 200 grams of carbohydrate per day, divided into four meals of 50 grams each. The very simplest thing to do is to take this in the form of drinks containing glucose or ordinary sugar. Ten grams of carbohydrate is contained in two large lumps of sugar or two teaspoonfuls of sugar or glucose (that is one-third of an ounce by weight). Fifty grams is contained in five times this amount. So you take ten lumps of sugar or ten teaspoonsful of sugar or glucose dissolved in tea, lemonade or just plain water in place of each meal. How are you going to get the sugar or the glucose? Well, glucose can be got from the chemist on a doctor's prescription—and every diabetic on insulin should have some in reserve for times like this when he is ill. If you have to use ordinary sugar—well, you'll just have to beg some from somebody's

ration. After all it's an emergency, and it shouldn't happen often. I am going to repeat these directions once more. If you are ill and cannot eat your diet—continue your normal dose of insulin—take the carbohydrate of your diet in fluid form—call in your doctor at once if you are getting worse and in any case if you are not better in 24 hours—and you won't go seriously wrong.

The other important complications are the late ones. They affect particularly the eyes, the nerves and the legs and feet. Older diabetics, and very rarely young ones, are liable to get cataracts or opacities in the lenses of the eye, and an affection of the light-sensitive layer of the eye, which we call retinitis. Diabetics who are untreated or badly treated occasionally develop a nerve disease which we call diabetic neuritis or neuropathy. But far the most common and important late complications occur in the feet. The arteries of older diabetics are liable to become hardened, narrowed or even blocked more easily than those of non-diabetics. This leads to a diminished blood supply to the legs and feet, which may show itself in various ways—as pain in the calves on walking, or pain in the feet in bed at night; or as sores, ulcers, or what we call gangrene of the toes and feet. Gangrene occurs when the blood supply is cut right off, and it means in fact that the toe or foot dies and shrivels up. A small area of gangrene may dry up and come away on its own, but sometimes amputations have to be performed. Gangrene isn't a very pleasant subject to talk about, and the real point is—what can we do to prevent these complications?

First, treat the diabetes properly. There are all kinds of things we don't know, but we do know that all complications are much rarer in properly treated diabetics, than in badly treated ones. Proper treatment of diabetics means treatment with insulin in all but the mildest cases—further than this I can only say that it means following conscientiously the treatment given you by your doctor or diabetic clinic. Insulin, dieting and so on are an awful nuisance at times. But stick to it. You will greatly lessen the risk that you may one day develop one of these complications.

Another thing is to keep your weight down to normal or if you are already fat to get your weight down to normal. I mean to talk about this another time.

The last important thing that patients can do is to look after their feet. This is not just one of those pious hopes that doctors sometimes indulge in. Proper care of the feet will greatly reduce the risk of gangrene of the feet and toes. You should ask your doctor exactly what you should do and at what age you should begin taking special care of your feet. Any diabetic who has had any sign of foot trouble should certainly start to take precautions and most diabetics over say fifty should do the same.

What are these foot precautions? First protect the feet from any kind of injury, minor injuries are often the starting point of more serious trouble. Never walk about in bare feet, treading on upturned drawing pins and stubbing your toes on the furniture. Always wear well fitting shoes, and well fitting woollen socks, and see that they don't pinch or hurt the feet. Don't let your feet get too cold or too hot. In particular be careful of hot water bottles. Old diabetics often can't feel heat, so that they may burn themselves without knowing it with a hot water bottle. Many cases of gangrene have started in this way. Cut the toe-nails straight across the top and don't go digging down the sides. If you have ingrowing toe-nails or corns don't cut them yourself. Go to a chiropodist—every diabetic clinic should have a chiropodist and I think every diabetic over fifty should pay regular visits to the chiropodist. Go to a chiropodist, who knows about diabetic feet, and of course tell him you have diabetes. Finally keep your feet scrupulously clean and avoid what we call "athlete's foot." That's the kind of whitish flaking of the skin between the toes that many people have. The way to do this is to wash them every day with warm water, dry them carefully, avoiding dragging the towel between the toes, and powder them with a simple dusting powder.

This routine of washing, drying and dusting your feet should become a regular part of your everyday toilet. If you have a sore or an ulcer or an injury of some kind don't on any account apply iodine or strong remedies. Report it to the doctor and take his advice.

6. Diabetics at Work and on Holiday

DOCTOR: Would you tell us what a Diabetic Almoner does—because I'm sure a lot of people don't know.

ALMONER: Well, suppose you're a diabetic.

Miss LAWSON: He's a doctor—I'm a diabetic.

ALMONER: Well, my job is to make sure you can follow—that its possible for you to follow the instructions of the doctor and the dietician. Sometimes you need material help from the Almoner.

Miss LAWSON: You mean money ?

ALMONER: Yes, money, amongst other things, or perhaps you want to know something or just talk things over with someone. Whatever the kind of help you need remember the Almoner's your friend and is there to help you.

Miss LAWSON: Well, go on.

ALMONER: Suppose you're a new diabetic; I arrange for you to get insulin, to get a syringe and to get scales, and I arrange for the district nurse to come and teach you how to give your own injections.

Miss LAWSON: Suppose people can't afford to buy their extra rations ?

ALMONER: There are State and Voluntary Organisations ready to come to your aid, so you see you can always get help. Just go along and see the Almoner.

Miss LAWSON: Supposing they go to a small hospital which doesn't have an Almoner ?

ALMONER: Then they see the Doctor. Remember there is the National Health Service, and there is still the Assistance Board. There is the Medical Officer of Health and the voluntary organisations. And of course there is the Almoner—or the doctor, at the clinic.

Miss LAWSON: All to help.

ALMONER: And since the 5th July every new diabetic using the new service can get syringes free of charge. If you are already a diabetic I can't promise you will get new syringes free of charge, it depends what happened to the old ones.

Miss LAWSON: Do I get free insulin ?

ALMONER: Yes, and needles.

Miss LAWSON: If I need scales ?

ALMONER: Scales are not as yet provided under the Health Service but I can put you in touch with your Medical Officer of Health if you need help to buy them. The National Assistance Board is there if you need more money to buy food. The District Nurse teaches you as before to give your own injections, or gives them to you herself if for instance you have failing eyesight or are getting on in years and really can't manage by yourself (but she's a very busy woman).

There are still funds the Almoner can call on if you find fares too expensive to attend hospital regularly, and I can arrange special transport where the doctor doesn't think you fit to travel by bus or train. I can also put people in touch with help if their eyesight should be getting very dim.

Of course your problem may not be a financial one. Suppose you live alone and can't cope with the queuing and cooking which your diet demands. Some diabetics are fortunate in having Invalid Kitchens where they can have their mid-day meals at a reasonable price. Sometimes the kitchens will even deliver meals to your home. Alas these kitchens are all too few, but the Almoner will have a list of them, and it's worthwhile asking her if there is one in your district. Sometimes a note from the Almoner to a firm's canteen manager will set the ball rolling for the provision of special diets.

Miss LAWSON: That means of course letting your employer know that you are a diabetic. Personally I've never found it necessary to say anything about it—when discussing an engagement I mean.

DOCTOR: I think every diabetic has got to decide for himself whether it is in his best interests to reveal his diabetes—go on the Disabled Persons Register—and get what advantages from it he can, or to keep the fact that he has diabetes to himself. After all

many diabetics are just as good workers as non-diabetics and it's no one else's business that they are diabetics. It may not be in their best interests to go on the Disabled Persons Register.

ALMONER: It is impossible to generalise about work, isn't it ? I do know a window cleaner who has been at his job for 12 years; when he feels a reaction coming on he takes a lump of sugar and tells his mate to do the upstair windows whilst he takes the ground floor and basement ones. He says he wouldn't change his job for the world.

DOCTOR: If you have diabetes, there are very few forms of work that you can't do. Hard physical work won't do you any harm—in fact many doctors think that diabetics doing hard physical work get on better than those in office jobs. A lot depends on how well your diabetes is controlled—and how much you know about how to manage it and avoid reactions. If you are really good at this there are almost no jobs which you shouldn't do—except those like driving trains, which would bring other people into danger or like climbing on scaffolding—which might bring you into serious danger. But there are two main reasons for which diabetics may have to find a new job. Their job may be actually unsuitable, because they are liable to reactions and the work does bring them or other people into danger—or they may lose their job or be unable to obtain one because employers know they are diabetics. What's the Almoner got to say about that ?

ALMONER: If you like, the Almoner will forward a medical report to the Disabled Rehabilitation Officer at your local labour exchange. He'll very likely suggest that you get yourself put on the Disabled Persons Register. And he knows about the openings and the conditions of employment within easy travelling distance of your home.

DOCTOR: And I think the Diabetic Association has an organisation to help diabetics find jobs—is that so, Miss Rogers? (Miss Rogers is the Organising Secretary of the Diabetic Association).

Miss ROGERS: Well, we do have an Employment Committee, but we find we can help more those diabetics already in jobs who are turned down on their medical for permanent status and superannuation benefits. Many employers are still thinking in terms of the pre-insulin era and think that diabetics are bound to be a liability. However, the Civil Service for one has set a splendid standard in employing diabetics. Provided he or she is reasonably stable they are quite prepared in certain branches to give their diabetic employees full superannuation benefits on the permanent staff.

ALMONER: And may I say a word about convalescence ? I don't suppose all diabetics by any means know about the two excellent homes started by the Diabetic Association, Miss Rogers—one for men at Burley-on-the-Hill, in Rutlandshire, the other for women and children up to 12 at Birchington-on-Sea in Kent. If the doctor feels you are in need of a rest and change of air, arrangements can be made for you to go to one or other of these homes. There you will not only have a real holiday and convalescence but you will be taught new recipes and much that will be useful to you on your return home. It will be good news to many to hear that no charge is made by either of these homes to those making use of the National Health Service.

Miss ROGERS: I'm glad you like our homes, Miss Kempe. We can also send people a list of guest houses and hotels where diabetics may feel secure and confident—very often the proprietor is a diabetic himself. These places are very useful for new diabetics who want a short time away from home without strain. I'm afraid though most of these places are in the south of England. But if you're an experienced diabetic there's almost no end to what you can do—in fact we've just fixed up for a boy of fifteen to spend his holidays in Norway. Don't be afraid of going abroad —for instance to Eire, Switzerland, the Scandinavian countries, and some parts of Italy and France. The Association can help you to choose if you like, and tell you in which countries there are Diabetic Associations and what services they provide. Speaking from experience I should say don't rely on restaurant

services in trains or even planes—in a train you may not be able to get into the restaurant car. I was once caught out in this way on a train at dinner time. Having injected, I found the restaurant full up and had to resort to glucose tablets which did me out of a good meal. I don't like glucose or sugar very much in any case. The safest plan is to take sandwiches at least for one meal. Have you tried the three decker variety which only takes three slices of bread for two fillings of cheese and meat? They're really ideal for the diabetic. If you choose a big hotel in this country, remember kitchens may shut down at an early hour, so I suggest chocolate and biscuits with you as a standby for your nightcap—ordinary plain chocolate by the way has just the same carbohydrate as bread, weight for weight, of course.

DOCTOR: One thing that must occur to all of us is should diabetics drive cars? I understand the legal position is that diabetics can hold driving licences and do not have to reveal in applying for them that they are diabetics. This puts a great responsibility on to them to see that they are not a danger on the road. A few unstable diabetics who are particularly liable to reactions should not drive at all and it's their doctor's business to tell them so. The majority drive quite safely provided they use common sense and know how to avoid reactions. After all if you were going to disqualify all diabetics from driving to be fair you would also have to disqualify a lot of other people too—anyone for instance who is liable to fainting attacks and I think anyone with high blood pressure because they might have a stroke.

7. If you need no Insulin

When patients come to a doctor with diabetes, their greatest fear often is that they will be told they must have insulin injections. Some of them are much more worried about this than about the fact that they have diabetes. If only, they say, I didn't have to have injections I wouldn't mind anything else.

If you talk to them, you find they have all sorts of mistaken ideas. You may find they have a mental picture of diabetics on insulin as people who drag out a miserable and semi-invalid existence, barely kept going by these awful injections. Or they may feel that doctors go around carelessly condemning people who don't really need insulin to a life of injections, and that once they accept these injections—whether they need them or not—they will never be able to escape them.

If any of you have ideas like this, I hope you were listening a few weeks' ago when several diabetics told us what they thought. Young and old, they all said the same thing. Of course insulin injections *are* a nuisance, but they are not the awful fate that people think. They hurt very little. But, most important of all—and I needn't go on stressing this, because all the patients told you the same thing—diabetics who have no complications and who are properly treated with insulin feel perfectly well and enjoy vigorous health.

The point about unnecessary insulin is an important one. Now doctors are busy people, and like you, they don't go around looking for unnecessary work. Putting a patient on insulin and teaching him all about it means a lot of work for the doctor. He isn't likely to start you on insulin unless he thinks you really need it, which brings me back to the question—who needs insulin and who doesn't?

You remember in Pharaoh's dream there were seven kine that were ill favoured and lean fleshed, and seven well favoured and fat fleshed. So also there are lean diabetics and fat diabetics. Speaking generally, and there are of course exceptions, the lean diabetics are the younger ones—when they have diabetes they have it badly, and they all must have insulin. You remember I said that an untreated diabetic couldn't make use of the carbohydrate in his food, and insulin enabled him to use it. The only way to treat a diabetic without insulin is to reduce the carbohydrate in his food to an amount he can make use of. Now if a patient is already very thin, and above all if he is still growing, it would be plain madness to restrict his diet so that he got thinner or so that he couldn't grow. So *all* young and thin diabetics

must have insulin. In practice, they usually feel really ill, and there's no difficulty about convincing them that they need it.

The fat diabetics—I'm speaking now of untreated ones—are usually the older ones, and their diabetes is often much milder. Some can quite well be treated by diet alone. If they are much overweight, it not only doesn't hurt them to reduce the carbohydrate in their diet, it does them no end of good. Many fat people with mild diabetes have only to reduce their weights to about normal by dieting, to find that their diabetes is cured (or practically cured), and they can then increase their diet cautiously without sugar returning. Now that's fine—when it really happens. Sometimes, things don't go according to plan. The patient is put on the diet but he or she—in my experience it's more often she—doesn't lose weight. I shall return to that in a moment.

Anyone can recognise the lean, and severe diabetic, who must have insulin, and the fat, older and mild diabetic who can often be treated without insulin. The difficulty comes with the what we might call the in-between ones. Should they have insulin ? It depends on a lot of things—the severity of their diabetes for one, and whether they have any signs of a complication for another. I can only say go to a competent doctor or diabetic specialist who will consider all the facts of the case, and take his advice. But *do* take his advice. If he says insulin, don't go hunting around for another doctor, who is willing to treat you without insulin—he probably doesn't know as much about diabetes—and don't above all, go searching for some patent remedy or fancy cure.

Suppose you are recommended insulin, why shouldn't you try and avoid it, which after all is only human ? Well, first, because if a competent doctor says you need it, you will almost certainly feel enormously better once you have taken the plunge and started it. I know of many patients who have refused to start taking insulin, but of very few who have refused to go on with it once they had started. You see, they know then how little trouble it really is, and how much better they feel when taking it. All right, you say, but I don't like the idea of these injections, and I'm quite willing to go about feeling a bit below par, if I can avoid them. If you decide to do that, the chances are that you will be going about with too much sugar in your blood, and sometimes also with some ketosis too. And if you do that, besides feeling below par, the chances that you will develop some of the complications that I talked about last week are very greatly increased. Further—and I'm sorry to have to labour this—once you have developed these complications they are all difficult to treat, and for some of them there's really no treatment, the changes are permanent.

So my advice to any borderline diabetic, one whose diabetes is neither really severe nor really mild, is this. Don't be afraid of insulin. It isn't a quarter as bad as you think. It will almost certainly make you feel much better. If you refuse it, you may get along all right for some years, but you will greatly add to the risk that you'll one day get serious complications.

Before we leave this subject of insulin, there's one more point. If you are on insulin—don't get worried about the amount you are taking. Now I did not say don't worry about taking the right amount—that's obviously important. I said don't worry about the amount you are taking. It's rather a paradox but the best dose of insulin for you is not the smallest dose you can get away with, but the largest dose you can take without getting insulin reactions. This is the dose which keeps your blood sugar normal or as near normal as possible. So don't worry all the time about getting your dose of insulin down. The best way to feel well, keep your blood sugar normal, and avoid complications, is to keep the dose up—up to just short of the amount which gives you reactions.

Suppose—at last—that you really don't need insulin, and that you are to be treated by diet alone. And suppose you are fat—say for your height and age you should weigh 10 stone and you actually weigh 13 or 14. Your doctor will strongly advise you to go on a strict diet and get your weight down

to something like normal. Now this can be done with the aid of a little self-discipline, and those who achieve it usually feel much better, more energetic, and so on. As regards your actual diet, you should take the advice of your doctor. Serious weight reduction by dieting should always be done under medical supervision. People have reduced themselves to ideal proportions, or should I say the fashionable proportions of the moment, and then been unable to stop. Someone wrote an " Epitaph for a Foolish Lady ":

" Here, in a grave, remote and quiet,
Starved by a new reducing diet,
Lies foolish little Mrs. Skinner
Who smiled to see herself grow thinner,
And kindly Death, when she had gone,
Reduced her to a skeleton."

But I don't want to frighten you. I can assure you that for the one very rare case in which the patient loses too much weight, there are literally thousands who don't lose enough.

How is it done ? An average man, lying completely at rest uses up calories at the rate of about 1600 in 24 hours. That is what we call his basal requirements. It isn't difficult to construct a diet of 1,200 calories. Right, then, reduce his calorie intake to 1,200, and he must lose weight, particularly if he's up, about and working—and therefore using more than 1,600 calories a day. It means cutting out potatoes, sugar, sweets, puddings, cakes, fried foods, thick soups, mayonaise and so on. Life would hardly be worth living, some of you will say. But, in fact, as long as you can get meat, fish, some cheese and plenty of green vegetables, some root vegetables, salads, tomatoes, and most fruits, you can do very nicely—and after a few days, after you have broken your habit of eating that is—you needn't feel unduly hungry. I know this because I reduced my own weight a stone or two in this way some time ago.

When a person of average size, that is with basal requirements at rest of about 1,600 calories, doesn't lose weight on a 1,200 calorie diet, I'm afraid there's only one answer. He's not keeping to the diet.

The patient always thinks of course that he's the one exception—the person who really doesn't lose weight under these circumstances. And he's so persuasive you almost begin to believe him. Then you realise that no engine, animal or mineral, as they say on another programme, can run without fuel or with too little fuel. So I say to these patients—when you can show me a motor car running along without petrol or a railway engine running without coal, then I'll believe that you are keeping strictly to your diet and not losing weight.

Appetites do vary, of course, and I know its really difficult sometimes, but if you are fat, your weight *can* be reduced to normal by dieting. Large numbers of fat but mild diabetics have done it, have felt immensely better, and, in that way, have got rid of or nearly got rid of, their diabetes.

Finally, suppose you are of normal size and have a mild diabetes which does not require insulin. You can be given a diet in which the carbohydrate, or more accurately the sugar which is formed in the body from the diet, is reduced to an amount that you can make use of. This usually means cutting down the carbohydrate—bread, potatoes, puddings, cakes, and so on, and making up the calorie value of the diet with protein and fat—things like meat, fish and cheese. Again you needn't feel hungry as long as you can get green vegetables, fruits and salads, and the diet needn't be monotonous—you can easily vary it if you have once learnt how. I can't tell you how in this talk. There are books to help, but the best thing is to go and talk it over with the dietitian in a diabetic clinic.

8. Marriage for diabetics and some final points

Should diabetics marry ? Of course, the real question is should they marry *and have children ?* Before we can answer this, we must ask one or two further questions. Is the risk of pregnancy and having a baby greater for a diabetic woman than for a non-diabetic one ? What are the chances that a diabetic mother will have a healthy live baby ? And if she does, will the baby later develop diabetes ?

First then what's the risk of pregnancy to a diabetic woman? Before the days of insulin—that's before 1923—the question hardly arose, because diabetic women for practical purposes never became pregnant. If ever they did the risk was very great. Insulin has changed all that, so that diabetic women quite often become pregnant, and we can state definitely, that with insulin *and* of course skilled supervision the risk to the diabetic mother of a pregnancy and having a baby is a very slight one—it's very little more than the risk to a non-diabetic mother. We needn't worry too much then about the risk to the mother—provided, of course, she has skilled supervision. What about the child? I'm afraid in this case things are not so satisfactory. Until recently the general experience was that in about one case in two, or one in three, something went wrong either during pregnancy or during the birth of the baby so that the baby was lost. However, the babies that were born safely were perfectly healthy and grew up quite normally except that they were more likely than other babies to develop diabetes later in their lives. I shall return to this in a minute.

Recently it's been claimed in America that a rather expensive and elaborate treatment of the mother during pregnancy with certain gland preparations or homones will prevent things going wrong, and very greatly reduce the risk to the baby. In Boston, where most of this work has been done, it is said that only one baby in ten or even twenty is lost now—instead of the one in three that for years was the best that could be done. Now this treatment with hormones is new, and for various reasons not very much has yet been done about it in Britain. But it looks as if we can look forward to a time when pregnancy in a diabetic woman—already made safe for the mother by insulin—will also become reasonably safe for the child. In that case it's likely that more children will be born to diabetic women—and that brings us to the third question.

What's the risk that children born to diabetic parents will themselves develop diabetes? Well, diabetes is not a hereditary disease in the sense that the disease itself is handed down from parents to children. But a *tendency* to develop diabetes undoubtedly does occur in families and may be handed from parents to children.

Unfortunately we don't know exactly how this tendency is inherited, and can't for certain predict in the case of a given marriage how many, if any, of the children will one day develop diabetes. We can say, that if one parent is a diabetic the chances that one of more of the children will develop diabetes are greater than is the case with the children of two non-diabetics. And we can say further that if both parents are diabetic—or if one is a diabetic and the other is not a diabetic, but has diabetic relatives—the chances of the children developing diabetes are still greater.

So what advice can we give to a diabetic man or woman who wishes to get married? Well, we can't dictate to anyone that they should or shouldn't get married—or that they shouldn't have children. We can only give them the facts—so far as they're known and leave them to make up their own minds. I personally think it inadvisable for a diabetic man and a diabetic woman to have children, because the chances that the children will one day develop diabetes are rather high. The same applies to a diabetic marrying someone who has not got diabetes, but has got diabetic relatives. When a diabetic marries a non-diabetic, who has no diabetic relatives, there is a risk that one or more of the children will one day develop diabetes—but it's a much smaller risk, and one that I think should be taken, if the marriage promises otherwise to be a successful one. After all marrying and having children is always a risk in a sense, and children can develop much worse things than diabetes. The moral, of course, is that diabetics must be careful to fall in love only with non-diabetics, who have no diabetic relatives. In fact the only objection I can see to diabetic clinics is that they are places where young diabetic men and women may get to know each other, fall in love, and want to get married! Apart from this, I think

that both partners should know something about diabetes and should go into the marriage, so to speak, with their eyes wide open. They should both know what a diabetic life means for one of them and possibly sometime for a child also. If they still want to go ahead, get married and have a family, I think they should certainly do so.

Thinking over these eight talks I notice a point of view that has constantly been turning up—almost a kind of theme song. It concerns the diabetic's attitude to his disease—what he or she thinks about it. I'd like to tell you how I came to be interested in this. A good many years ago, when I first started looking after diabetics, I happened at the same time to have two patients, who had come on to me from other doctors. One was a middle-aged man. His diabetes was only moderately severe. He lived down in the country, where he had his own apparatus for doing his own blood sugar. He had no regular occupation, and as far as I could see he spent his time doing his own blood sugars—and incidentally ringing me up in London to know what he should do if his blood sugar had gone up or down a trifle. The treatment of his diabetes was his whole life, and I don't think his life was a happy one.

At the same time I had another patient—a young man with more severe diabetes, on a much larger dose of insulin. His home was near Bristol, but he was a commercial traveller. He spent the week travelling—rarely spending two nights or eating two meals in the same place—and every Saturday he went back to Bristol and played a hard game of rugger. He was living a full life and a happy one, in spite of his diabetes.

Those are rather extreme cases, but I think they'll help you to understand what I'm getting at. If you're so unlucky as to get diabetes, which road are you going to take ? You can easily make your diabetes the main thing in your life—and incidentally in your families' life. Or you can say—well, this diabetes is a bit of a handicap, but it's a handicap that can be overcome. I'm going to take pride in knowing all about my diabetes and how to manage it. I'll take pride in being able to look after myself, in being independent, and in living as normal a life as possible.

I often spend time explaining to diabetics how they can arrange to do the things they want to do. It rarely comes my way to have to tell them there is something they really can't do.

Occasionally I've met diabetics who take unnecessary risks. They refuse to recognise that they have any handicap at all, and do foolhardy things. In fact they defy the world and their illness and refuse to take even reasonable precautions. This attitude is what psychologists call over-compensation. It isn't a healthy one, because it isn't a realistic one. I think diabetics must realise they do have a handicap, and must learn to overcome it as far as they possibly can. And I hope I've convinced you that many of them do overcome it to a quite remarkable degree.

A word about the future. Insulin has made it possible for diabetics to enjoy vigorous health and with very few exceptions to do everything the rest of us do. But will they always have to take daily injections of insulin ? Obviously I can't tell you the answer. We don't know the cause of diabetes, but work goes on and knowledge grows. Personally I have little doubt that further big discoveries will come—but whether in 1948—58—68 or when, I have no idea. Patients with diabetes do not usually have irreversible changes in the insulin-producing cells in their pancreas, so that the cause of diabetes, whatever it is, should not be an irreversible one. I think there is good reason to hope that this cause, or perhaps I should say a chain of causes, will one day be discovered. It may then be possible both to prevent diabetes and to treat it in some other way.

I hope some of you have enjoyed listening to these talks, because I've enjoyed preparing and giving them. If any one who's been listening has come to see their diabetes less—well less as a disaster and more perhaps as an opportunity—an opportunity to show that a handicap can be overcome, I would ask no more.

And good luck to you all.

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